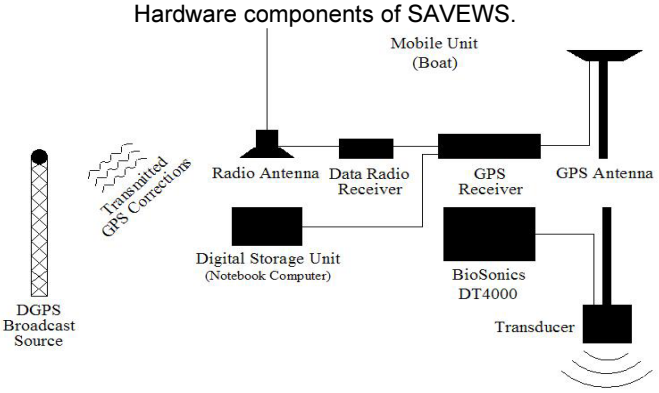
Submersed Aquatic Vegetation Early Warning System (SAVEWS)

US Army Corps of Engineers

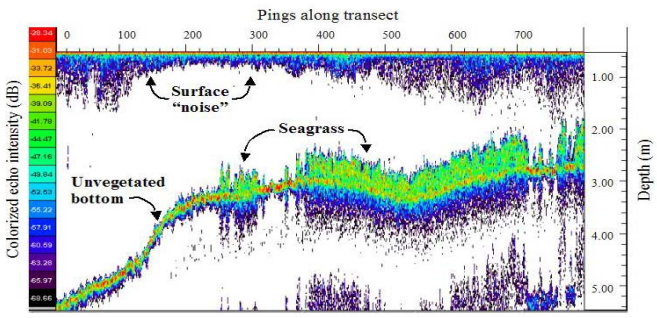
Background

The Submersed Aquatic Vegetation Early Warning System (SAVEWS) is a semi-automated acoustic-based measurement system that can detect and characterize submersed aquatic vegetation (SAV) while operating from a small survey boat. It uses an off-the-shelf digital echo sounder, with a narrow single-beam high-frequency transducer, and global positioning system (GPS) equipment to digitally record echo intensity and position data on a laptop PC.

Hardware components of SAVEWS.



Software developed at the U.S. Army Engineer Research and Development Center (ERDC-EL) processes the distinct signature of SAV within the recorded signal to determine depth, plant height, and plant coverage every few meters along transect lines.



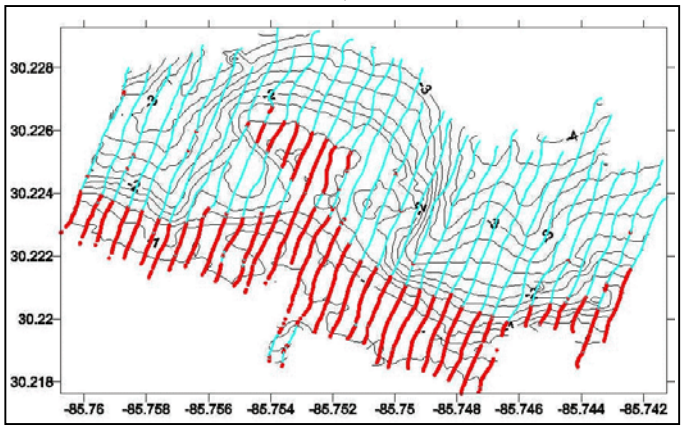
Typical echo intensity signal within a seagrass bed.

ERDC received a patent on the SAVEWS processor in 1998 and licensed it to hydroacoustics equipment manufacturer Biosonics, Inc. (Seattle, WA, 206-782-2211) in 2001. Biosonics markets SAVEWS, under the name EcoSAV, as part of their suite of shallow-water hydroacoustic environmental characterization products. Over 30 copies of the system are in use in North America, South America, and Europe by various government and private organizations, and by universities. It is used to assess ecologically important SAV (such as seagrass), to detect early infestations of nuisance aquatic plants (enabling early, more economic treatment), and to conduct bathymetric surveys of the bottom underneath dense SAV.

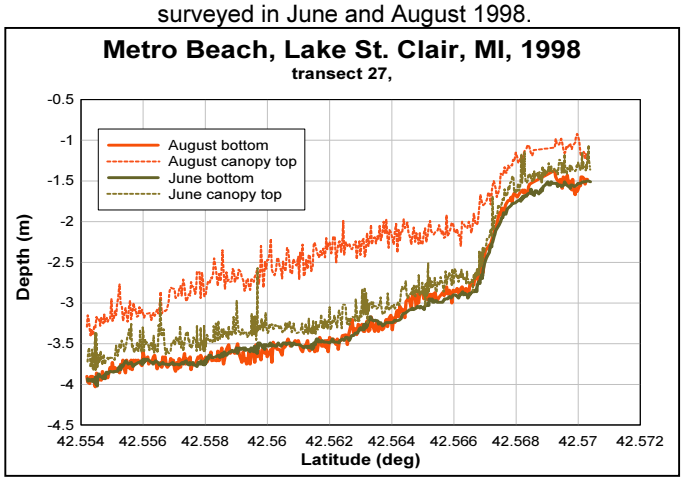
Capabilities

SAVEWS is typically operated along pre-planned transect lines using GPS navigation guidance. The processed data summarize plant attributes at closely spaced points along the line. A typical survey may consist of a set of parallel transect lines, separated by some fixed distance, running perpendicular to the local depth contours. Processed data from this survey can be used to generate bathymetric and SAV maps using any commercial mapping software package. Repeated surveys of a fixed set of transects can be used to monitor change in SAV over time. Graphic examples of SAVEWS survey results are shown below. More information on SAVEWS may be found in a 2002 article published in *ESTUARIES* (25(1):133-141).

Transect lines over SAVEWS-determined bathymetry.
Red indicates SAV detected, blue indicates no detection.



Changes in plant height along a single transect surveyed in June and August 1998.



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